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AMERICAN NAVAL GUNNERY—PAST AND PRESENT

BY ROBERT W. NEESER

“If I were asked by any admiral or captain what, in my opinion, is the highest duty in the training of seamen nowadays, I would say, ‘Gunnery, gunnery, gunnery.’”—Lord SELBORNE.

NEVER before in the history of the world have there been such extensive preparations for war. Every nation appears to have profited by the lessons which history has already so often taught: that the naval greatness of a country depends principally upon the manner in which its forces are trained. Spain, Holland, France, Italy, and Russia successively lost the command of the sea because they had not taken sufficient measures beforehand. How important then that preparation! But it must ever be borne in mind that this preparation is for war, and war only, and that its ultimate object is that the ships may be properly maintained and fully manned by efficiently trained crews. Little will it avail a nation to have the most powerful war-ships afloat unless it has taught its seamen the art of using them and their weapons to the best advantage.

From the very beginning the gun has been the decisive weapon in naval battles. An effective and accurate gunfire has ever been an overwhelming advantage, yet there is almost immemorial prejudice in the minds of the majority of naval officers against gunnery. One can hardly understand it. Many a writer has told us of the sailor’s fondness for his gun; how he petted and polished it. Very likely here was the explanation. So much time was spent petting and polishing that none was left for putting it to the use it was meant for. That was one reason for our successes in the War of 1812. Polishing guns had been the chief occupation of the English, whereas our ships had learned how

to use theirs. And yet the English (with one exception, Captain Broke of the *Shannon*) appeared ignorant of the secret of their adversary's superiority. "The fact seems to be but too clearly established," said the *London Times* on October 22, 1813, "that the Americans have some superior mode of firing; and we cannot be too anxiously employed in discovering to what circumstances that superiority is owing." Were you to ask of any naval officer what that circumstance was he would without hesitation answer: "Gunnery, gunnery, gunnery."

Early in its career the American navy made good use of this maxim and thus prepared itself in time for future action. The first reference of "Employ'd Exercising ye Guns & Clearing Ship" is found entered, on March 19, 1776, in the log-book of the *Andrew Doria*, one of our first cruisers to get to sea. Many times since then is that statement to be found. Its frequent repetition proves that, for many years at least, the importance of using the guns was recognized. And what proficiency was obtained! The log-book of the frigate *Constitution* tells us that during the attack on Tripoli she gave the batteries eleven broadsides of round and doublehead from her larboard guns in forty minutes. Such rapid firing is astonishing when we consider the weapons then used. A visit to the *Constitution* at Boston or to the *Victory* at Portsmouth, England, impresses this fact all the more deeply. Mounted on heavy and clumsy wooden carriages, the guns had to be trained with handspikes and side tackles and elevated by means of quoins. It took fourteen men to handle a long 32-pounder.

From the time that great guns first began to be used until very recently, the weapons were so weak that the ranges at which battles were fought were necessarily very short and the accuracy required to make hits not great. In those days it was a question of yardarm to yardarm, hard pounding at close quarters, when ships fired broadsides into each other at point-blank range or less. The guns were fired at long intervals, and the ammunition had to be brought up three decks sometimes by the powder-monkeys. But these were not the only handicaps that officers and men had to contend with. The question of sighting the guns was a grave one. Until the early part of the last century the method of doing this was of the most rough-and-ready description, and when shots struck the mark, unless the range

was very close, it was a matter of chance pure and simple. The only method of aiming then provided was known as the "line of metal" and consisted in running the eye along the exterior of the gun, parallel to the center of the bore, until it reached the object—some allowance being, of course, made for the inclination of that line to the axis of the bore, due to the metal being thicker at the breech than at the muzzle. The sights first used, if they could be called sights at all, were quarter-sight scales engraved on the sides of the base ring; at best these gave very poor results. "Yet why use sights at all?" asked naval officers of that day. As great a man as Lord Nelson objected to their introduction. "As to the plan for pointing a gun truer than we do at present," he wrote, "I shall, of course, look at it, or be happy, if necessary, to use it; but I hope we shall be able, as usual, to get so close to our enemies that our shot cannot miss the object."

Could a better reason have been given? With crude weapons had they not already succeeded? Why, then, introduce innovations which no one needed or wanted? The seaman of that day was expert in estimating distances; why encumber him with artificial means of doubtful value? The "nautical eye" had already proved a factor of no small importance in naval engagements. But sometimes the method was still more scientific. Continued practice had taught the men that at a thousand yards or over all the men on an enemy's decks looked alike; that at eight hundred yards they could distinguish a man from an officer; at six hundred yards they could make out a pair of well-developed side-whiskers; while at four hundred yards they could hear the men swearing; and so on down until the range at which they could see the whites of their eyes.

The close of the War of 1812 found the United States in possession of a large and highly efficient naval force, elated at its success and in a state of morale seldom equaled. Then followed a long period of peace during which the navy's sole employment was chasing pirates and slavers and cruising on foreign stations to display the flag. Gunnery and target practice came to be overlooked more and more, until they were neglected altogether. There was no need for gunnery; why, then, bother with it? Great-gun exercise from a daily duty degenerated to one held only "at one time and another" and then was "performed in full

dress, with cocked hat and sword, as a voluntary tribute to so grand an occasion." What an inspiring sight this must have been! Much more so than with the men stripped to the waist. And a few years later we hear of elaborate preparations being made for target practice on the ship-of-the-line *Columbus*, when her guns were fired for the first time, although she had been in commission twelve months. Captain William H. Parker, in his *Recollections*, wrote:

"I well remember the preparations for it; it took so long to get ready for the great event that we seemed to require a resting spell of six months before we tried it again. We were great in running the guns in and out rapidly, but some parts of the 'manual' would strike an officer of these days as very ridiculous; for instance, after the guns were pointed, the orders were very slowly and deliberately, 'Handle your match and lock-string,' 'Cock your lock,' 'Blow your match,' 'Stand by'—'Fire'; and if the ship did not remain stationary all this time it was not our fault."

About this time shell-guns were introduced into the navy for general use. Years before, in 1812, howitzers for firing shells at long range had been invented by Colonel Bomford. But their use had been discontinued after the war, and it was not until about 1839 or 1840 that these "novelties" were again used. Naval officers regarded them with suspicion; the shells they fired were a source of constant discussion. Captain Parker tells us that "they were kept in the shell-rooms and no one was allowed even to look at them; it seemed to be a question with the division officers whether the fuse went in first or the sabot; or whether the fuse should be ignited before putting the shell in the gun or not. However, we used to fire them off, though I cannot say that I ever saw them hit anything."

The Mexican War taught the service a great deal about gunnery. What it did not learn then it learned later during the Civil War, when greater strides were made in four years than in the eighty that had preceded. But in the mean time, after the close of hostilities in 1848, officers and men fell into the old rut and absolutely neglected the lessons so recently taught. Target-firing became but a tradition and gunnery a simple divisional exercise of running the guns in and out. One ship cruised for three years without firing a gun, except for saluting. It is not surprising, then, to hear how ignorant ships' companies became in the art of using their weapons. "Shells," wrote one officer in 1850,

“are a mystery which it is supposed will be explained some of these days. In the mean time poor Jack looks upon them with a mixture of fear and awe, and a lieutenant not very long ago asked me privately what composition was inside to cause the explosion.”

In the mean time, however, a few energetic officers, among whom Commander John A. Dahlgren was conspicuous, had turned their efforts toward modernizing the armaments of our ships of war, which then were far behind those of the maritime nations of Europe. The Dahlgren gun, our first production, attracted much attention both at home and abroad, and in 1857 Congress made an appropriation for the fitting of the sloop *Plymouth* as an ordnance ship for testing heavy shell and pivot guns. This was a great step in the right direction and gave results which only the most sanguine could have hoped for.

The story of our navy's gunnery during the Civil War is too well known to need repetition. No neglect of it was possible during those years. And no one certainly omitted this form of exercise. Only one case need be mentioned as an example—that of the *Kearsarge*, which is known to have held target practice repeatedly and on one occasion, only two months before her action with the *Alabama*, fired thirty-five shots at an improvised target.*

But after the Civil War gunnery in the navy again ran down until it came to be regarded as of little or no importance. True, the Regulations called for an annual expenditure of ammunition. But target practice was mere drudgery and no interest was taken in its results. It only dirtied the decks, blackened the paint-work, and was a general nuisance, which, when over, all were heartily glad to be rid of. Besides, there was little incentive for improvement. Years after the war we had the same old ships, the same old guns, and the same old way of using them. Guns were fitted with the same old open bar sights we had always used, while gun crews were trained in the same old way of firing on

* The rapidity of fire of naval guns, interesting at all times, is especially so during this period. With a well-drilled crew, we are told, a 9-inch smooth-bore could be loaded with an average time between fires of forty-three seconds; and the sloop-of-war *Cumberland* on a calm day is said to have averaged seven rounds per gun from her main-deck battery in fifteen minutes, though firing at a target placed to windward, and consequently obscured by the smoke from the guns.

the "weather roll." The same unsatisfactory target, which had been in vogue for years and continued in favor until 1902, was still used, with results all but useless. It consisted of a small triangular sail which was the "bull's-eye" of an imaginary target 100 feet by 25 feet. Target practice was a farcical proceeding, as we can imagine, and one in which guesswork was a chief factor. Any shot that came within a measurable distance was counted as a hit, for it was estimated that had a ship been there she would have been struck. In fact, the men were not much encouraged to hit the target, as it only caused delay.

But we were not the only ones in this state of stupor. The English also were blundering along in this manner. Mr. Lionel Yexley, who served in the British navy, has given us a vivid picture of its condition at this period. He tells us that his knowledge of naval gunnery was confined to polishing two iron slides of a 64-pounder, and his professional knowledge as a seaman to polishing the brasswork on the fore bitts, and that during one target practice when a gun captain put two shots in succession through the target all hands were spellbound by such remarkable shooting, but when with the next round he knocked away one of the poles supporting the canvas the officer in charge was heard to exclaim: "What is the fool doing? Does he want to keep us out here all day?"

With the appointment of Rear-Admiral Francis M. Bunce to the command of our North Atlantic Squadron in 1896, however, a new system of shooting was inaugurated which proved of immense value to the service and to which many have ascribed the success of a few years later. The old triangular targets were still used, but pains were taken to find out where the shot really struck, and days, instead of only hours, as heretofore, were spent on the ranges until the results desired were obtained. Then came the war with Spain and with it the real test of the ability of our gunners to hit a real target under all conditions. We went into hysterics over Manila and after Santiago our enthusiasm knew no bounds. Criticism of our victorious fleet would never have been tolerated and at the time was not thought of. But after a little while we began to investigate the question; then we realized that we were not wonderful, after all. The Spanish fire had been so excessively bad that we shone by contrast. The disappointing results, how-

ever, were not all due to a bad system of training or neglect. Some authorities agree that no circumstances could be conceived where wild firing could be more certainly provoked than those which the American fleet encountered at Santiago. Moreover, "groaning, lurching complications" (as one writer termed them) had to be contended with; the gun sights were improperly made and not of the best for long ranges, the elevating gear of the mounts was poor, and innumerable other defects existed which caused a handicap not easily overcome.

Then came the great change. Criticisms that had been pouring in at last were heeded and steps taken to better the results. To be convinced that things were really as bad as they were made out to be an official test was ordered. The battle-ships of the North Atlantic Squadron steamed past an old, condemned light-ship and poured broadside after broadside at the poor hulk. But she survived the ordeal unscathed, until, in desperation, the range was closed to 2,000 yards and three hits were registered. Something was the matter—and before long it was realized that, though a conscientious and careful system of training had been followed, it had been in the wrong direction.

The credit for our high records of to-day has been ascribed almost unanimously to the system inaugurated by an officer of the British navy. But it appears that the rejuvenation of American naval gunnery really began long before then—in 1892 on board the gunboat *Yorktown*, when the telescopic sight was first used. Its lessons, however, were not sufficiently appreciated by the service and the administration until years later, when actual facts brought us to our senses. It was simply a question of adopting new methods. Admiral Evans tells us how this came about during the years 1902–1903, when he commanded the Asiatic station. A most unsatisfactory condition of affairs existed. Breech-blocks jammed, training-gears were in such condition that keeping on the target was out of the question, the sights so defective that they were utterly useless, and the men could not shoot straight. Every attention was given to these matters and before long the Admiral was able to report everything "shipshape." But these were not the only details remedied. The present system of training was carefully studied by a number of officers, and from their efforts resulted those three secrets of success: the "ping-pong" machine, the "dotter,"

and the "dummy loading-machine." Never before had there been such an era of gunnery training as now set in. Every one went ping-pong mad—and to the continuance of that feeling are due our results of to-day.

All relics of the old system were now abandoned. By means of the ping-pong and the dotter* gun-pointers were taught the secret of continuous aim and of "keeping on the target," whether the ship rolled and pitched or not. The men without exception seemed to prefer the ping-pong device, which fired shots from a small rifle fixed to the guns, because they liked to hear the noise and see the holes made by the bullets, whereas the "dotter" made only a pencil mark which they could not see, but which has since proved to be much more accurate. An additional incentive was also found in the use of the dummy drill-gun,† a device by means of which the crews became expert in the handling of shells and powder-bags and at which they were now continuously exercised; such practice formerly had not been possible owing to the danger of wearing out the breech-blocks of the guns.

Surprising scores almost immediately began to be made at target practice, and an enthusiasm aroused among officers and men that needed no further encouragement. Whereas, in 1901, a 13-inch gun was allowed five minutes and twenty seconds between shots, two years later one turret-gun of that caliber on board the *Indiana* scored four hits in this time. The *Alabama* did even better with fifteen hits out of sixteen shots fired at an average time of one shot per minute. And a year ago, during elementary practice, the 12-inch guns of one of the *South Carolina's* turrets made the phenomenal record of sixteen hits out of sixteen shots in four minutes and thirty-one seconds. Such figures seem almost inconceivable to the uninitiated and would have been thought preposterous by navy men a decade ago. And

* These are ingenious devices attached to the guns; a small target aimed at by the pointer through the telescope simulates the action of a moving ship—the roll, pitch, etc.; every time the trigger is pressed a pencil or needle point (in the ping-pong machine a bullet) registers the accuracy of the aim; continuous practice may thus be held at no expense. Lewal, writing in 1863, describes devices such as these then in use in the English and French navies for the training of gun-pointers.

† The dummy drill-gun is a facsimile of the breech and powder chamber of a gun up to the point where the rifling begins, and loading it requires motions identical to those employed in loading and firing the real weapons.

yet all this has been accomplished in that short time in actual results, because the crews were trained and target practice was held in the right way.

It is during this latter exercise that the results of months of work are seen. Each gun crew, primed for the test, has this one opportunity of making good, with the eyes of the navy upon it. People may cry against the annual expenditure of such large sums of money for this purpose, but it is a necessity. Well as our men may be trained with ping-pong and dotter, their nerves are in no way affected when they fire the small cartridge of the former or press the trigger of the latter. But when the act of pulling that trigger causes a loud explosion and violent recoil of the guns, men's nerves, if unpractised, are so highly strung that the results are unsatisfactory. Target practice, therefore, must be held.

But what do they really do at target practice? A small paragraph may, perhaps, appear in the paper telling of the noise, the splashes, and the smoke, but not a word of the ranges, the records, or the scores made. And why? Because practically all that takes place during those weeks is a secret which every nation guards most carefully.

Twice annually our fleets hold target practice; in the spring and fall. The first, called elementary or record practice, has for its object the qualifying of pointers to shoot in battle practice, which comes next. In other words, the officers find out the men who can shoot the best and these are trained for the real work later on. The firing is conducted in the most careful manner. The ship is run over a specified course, with the distance from the target varying from about 1,600 to 2,000 yards. At a given signal the guns open fire, but only one at a time, each pointer firing a certain number of shots and each at his own target. Thus is a proper test obtained and the qualifications of the men known. Then after more months of training follows battle practice, in which it is seen what the ships can do against targets representing an enemy under actual battle conditions. The rules are very exacting; the firing ship knows neither the course nor the speed of the target nor the range, which has to be determined as in time of war, while the weather conditions must be taken as they come on the day appointed. Every one from the admiral down has his share of responsibility. However good the gunner may be, unless he has an admiral or captain who can put him in the

right place at the right time, good shooting will not avail much. Target practice is meant to teach not only the men how to shoot, but also the officers how to bring their ships into position, how to keep them there, and how to help the pointers in every way possible. It marks the culmination of months of training and work not only in gunnery, but in engineering, navigation, and fire control. The secret of success depends not on one alone, but on all equally and jointly.

Let us for a moment imagine ourselves on board a battleship at target practice; on board that grim vessel of war cleared for action. Everything on deck has been removed—stanchions, davits, and railings—boats hoisted on the upper deck, dead-lights boarded over, and ventilators taken down. Battle ports are tightly shut and everything movable down below has been stored away—electric fans and lights, wash-bowls, looking-glasses, pictures, and china all laid in a store-room out of harm's way. As the ship nears the range the alarm gongs ring, sounding general quarters; bugles call officers and men to their stations. Every one drops what he is doing and rushes to his place. All seems confusion, but it is only an orderly confusion in which each one knows exactly what he is to do. Then with all in readiness you await the anxious moment. The whistle blows and the work begins.

You are inside that low, cramped chamber, called a turret, standing in the narrow passage, not two feet away from one of the 12-inch guns. It is the only place where you can be without interfering with every one. About you in the dim light of the battle-lanterns you see the gun crew. Joking, but talking in whispers, they do not appear nervous or anxious about the test that is to begin. You feel the massive turret revolving slowly and smoothly beneath you, but see nothing outside. Eleven inches of steel are between you and daylight.

At the word of command from the quiet-voiced officer in charge all is action, but no confusion, no hurry. Metallic rumbling sounds from the depths of the ship announce that the shells and powder-bags are being loaded upon the car; the trap-door to the handling-room opens its steel jaws as the ammunition-car rushes up into place before the breech of the gun, which has meanwhile been opened. In go the 860-pound shell and the 320 pounds of powder. The breech is shut, the car has disappeared below, the shutter is again

closed, and the big piece is ready. All so quickly that you instinctively look at your watch to see whether they have made a new record. You hear a dull roar—it takes you by surprise, not expecting it so soon—you feel the turret swerve to one side, see the gun leap back in recoil and instantly go back into battery, hear a whirring sound as the compressed air expels the burning gases through the muzzle—then all is action again. So easy, you think, mere child's play. But it is a skill that comes only after months and months of hard, conscientious training.

As the gun goes off you do not feel much of the tearing displacement of air outside, the "blast"; the steel wall of the turret protects you from the results of the explosion of all that powder. But it is on deck that you get the full benefit of all that you cannot see or feel inside. You strain your eyes, keeping them on the muzzle as you watch for the blast. Will it never come? you ask yourself. But it does come and always when you least expect it. The white flame appears brighter than anything you have ever seen; a tremendous cloud of yellow gas* rushes out of the muzzle and the roar shocks you. With good glasses you can readily pick up the shell, follow it right along through the air, and see it pierce the target screen. An enormous geyser hundreds of feet high leaps into the air. Then another and another as the shell ricochets, and each, miles farther away.

With it all comes a peculiar roar. It sounds more like the rush of an express-train as it dashes in and out of tunnels and up and down valleys. And before you have lost sight of it comes another flame, another deafening roar, more geysers—and so it goes until the whistle blows the "Cease firing!" and it is all over.

Then the ship swings around, the gun crews pour out of the tops of the turrets and crowd to the rail to see what

* One is naturally astonished that smokeless powder should produce so much smoke. But the powder charge proper is really smokeless; the smoke produced comes only from the ignition charge, which is indispensable, owing to the lack of inflammability of smokeless powder. Fourteen pounds of powder are required for the ignition charge of a 13-inch gun. The smoke is therefore considerable, but it is so mixed with the large volume of colorless gas that it dissipates readily enough. A point four miles distant is visible in five seconds after the firing of a 13-inch gun, whereas with brown powder the time taken was twenty-five seconds. This is in calm weather; in a breeze the five seconds would be considerably lessened.

they have done. A mighty cheer goes up when the good news is known—then the ship resumes her place in line and the next one fires in her turn.

Day firing is glorious, but it is nothing compared with night target practice with the torpedo defense batteries. The method of holding it is the same, except that the targets are illuminated by search-lights from the firing ships. It is a beautiful scene. The beams of the search-lights and the flight of the “tracers” present a spectacle you have never dreamed of before. The idea of using tracers seems to have been an American invention. An English newspaper has described them as consisting “of a small metal cylinder screwed into the base of the shell containing a secret composition largely formed of magnesium. As the shell leaves the muzzle it shows a light, which continues burning throughout the trajectory of the shot through the air.” And thus the exact flight of each projectile can be watched in its course to the target.

Though accustomed to the noise by this time, the small calibers decidedly disconcert you. The flash by night is more blinding than in daytime, the explosion far more penetrating, and the guns fired so rapidly that you have not time to recover from one before the next goes off. Your eyes are strained looking through the inky blackness of the night with a telescope. The flash blinds you, but in a moment you see the shell, revealed by its tracer, curving through the air. You see it hit the target and the splash in the beam of the search-light as the shell strikes the water. Often the guns are fired so rapidly that several of these rockets are in the air at the same time, leaping and curving like fireworks in the night. And when guns of several calibers are fired at the same time, you see the big fellows overhaul and pass the smaller ones before they reach the target.

Such is the present status of gunnery in the American navy and its history in the past. A stage of development has now been reached never before thought of, due to the perfection of ordnance and the establishment of a uniform and efficient system of training.

ROBERT W. NEESER.